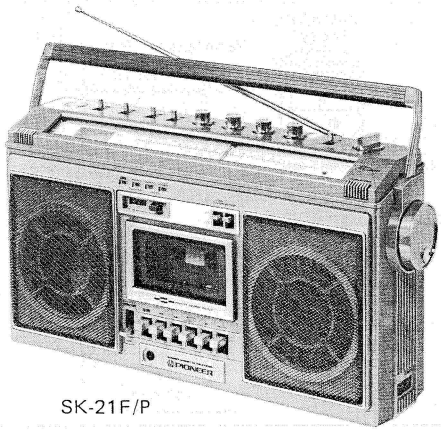
SK-21F P

MW/SW1/SW2/FM STEREO
RADIO CASSETTE RECORDER

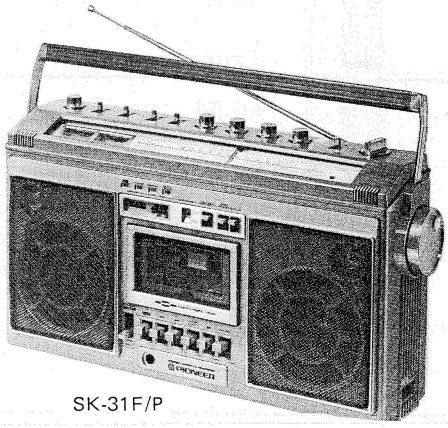
SK-31F P

MW/SW1/SW2/FM STEREO
RADIO CASSETTE RECORDER

SERVICE MANUAL



SK-21F/P



SK-31F/P

Subject:
The differences with the model SK-21/KC, SK-31/KC are mentioned in this service manual. So please make use of this manual together with the one for SK-21/KC, SK-31/KC.

SPECIFICATIONS

Max. output power	10W (total music power)
Speaker	12 cm (4-3/4 in.) woofer (SK-31) 4.2 cm (1-5/8 in.) tweeter (SK-31)
Speaker	12 cm (4-3/4 in.) full range (SK-21)
Wow and flutter	0.09% (WRMS)
Frequency response	50 ~ 12,000 Hz (Chrome)
Input	AUX L/R, EXT MIC L/R (with terminal for remote control use), MIX MIC (with terminal for remote control use) (SK-31) EXT FM ANT
Output	LINE OUT L/R, EXT SP L/R, headphone
Subfunction	One-side repeat, song finder, editor, one touch recording, tone control (Bass, Treble), stereo/wide switch, tape selector (Normal/CrO_2), FM mode/BFC switch memory & stop (SK-31), programmable repeat (SK-31), hi-filter (SK-31)
Indicator	Repeat (Green LED), song finder (Red LED), power (Red LED), REC (Red LED), FM stereo (Red LED), end mark (Red) (SK-31) Lch. level meter (Battery check) (SK-31), Rch. level meter (FM center tuning) (SK-31), Level meter (Battery check) (SK-21)
Frequency range	FM: 88 ~ 108 MHz SW1: 2 ~ 6 MHz SW2: 6 ~ 18 MHz MW: 525 ~ 1,605 kHz
Power source	120/220V AC 50/60 Hz, 9V-DC (Six 1.5V "D" batteries), EXT 9V DC
Power consumption	14W
Dimensions (W × H × D)	446 × 245 × 126 mm (17-1/2 × 9-5/8 × 5 in.)
Weight	5.2 kg (11.4 lbs.) (SK-31) 5 kg (11 lbs.) (SK-21) without batteries

Note:
Specifications and the design subject to possible modification without notice due to improvements.

PIONEER®

ADJUSTMENT

MW IF ADJUSTMENT

• Connection Diagram

Switch positions
Function switch . . . . . RADIO
Band switch . . . . . MW

Generator Scope
Sweep center frequency 455kHz
Input gain . . . . . 0.3 Vp-p/cm

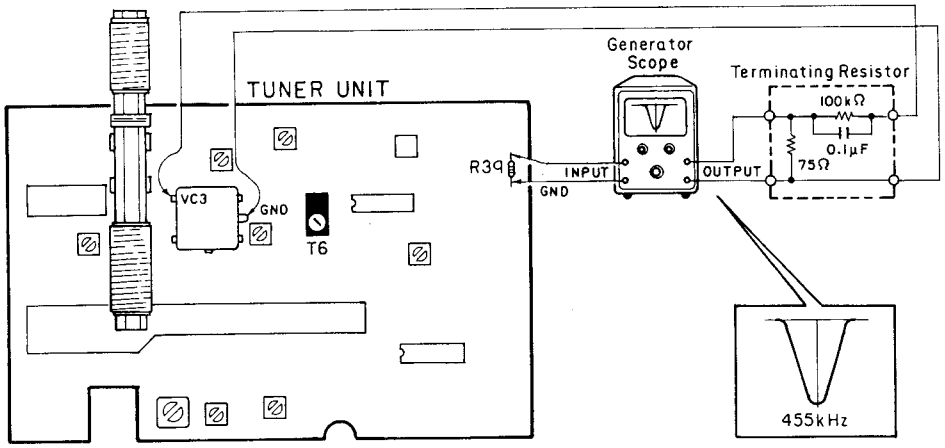


Fig. 1

• To Adjust

1. Set the input of the Generator Scope to the range within which the U curve can be verified and move the T6 until the U curve is adjusted to its maximum amplitude and optimum symmetry.

MW TRACKING ADJUSTMENT

• Connection Diagram

Switch positions
Function switch . . . . . RADIO
Band switch . . . . . MW

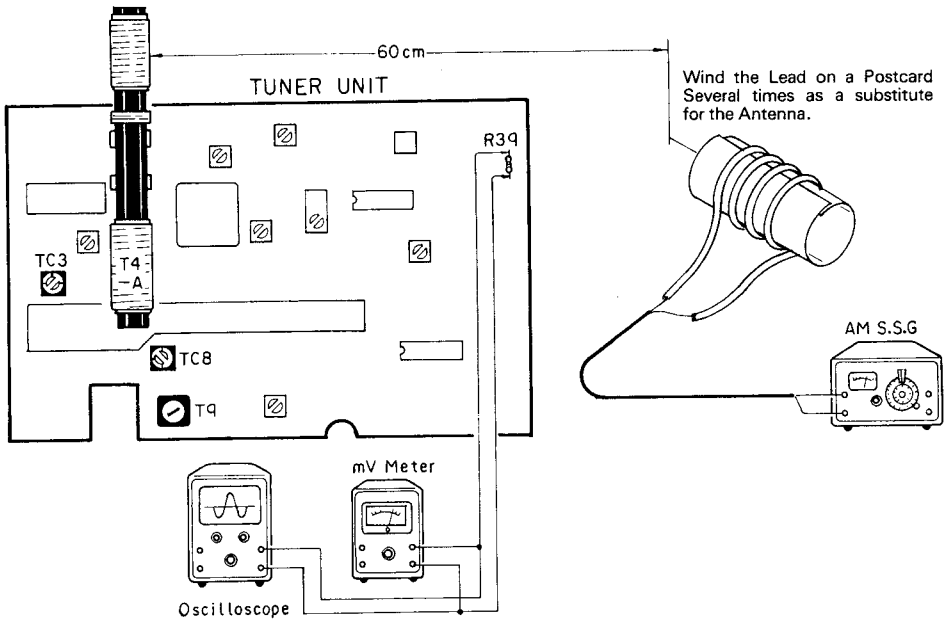


Fig. 2

• To Adjust

Frequency of MW SSG	Variable Condenser Position	Adjusting Point	Remarks
1. 510 kHz (400 Hz, 30% modulation) output 60 dB/m.	Maximum (turn the tuning knob counterclockwise.)	T9	510 kHz can be received.
2. 1,650 kHz (400 Hz, 30% modulation) output 60 dB/m.	Minimum (turn the tuning knob clockwise.)	TC8	1,650 kHz can be received.
3. Repeat (1) and (2) alternately and adjust so that 510 ~ 1,650 kHz are received.			
4. 600 kHz (400 Hz, 30% modulation) output 40 ~ 50 dB/m.	Tuned to 600 kHz.	T4-A (Coil of bar antenna)	Maximum output.
5. 1,400 kHz (400 Hz, 30% modulation) output 40 ~ 50 dB/m.	Tuned to 1,400 kHz.	TC3	Maximum output.
6. Repeat (4) and (5) alternately and confirm that they are as specified.			

Note: After adjusting T4-A (Coil of bar antenna), melt electro wax with soldering iron and fix it in position.

SW1 TRACKING ADJUSTMENT

• Connection Diagram

Switch positions
Function switch . . . . . RADIO
Band switch SW1

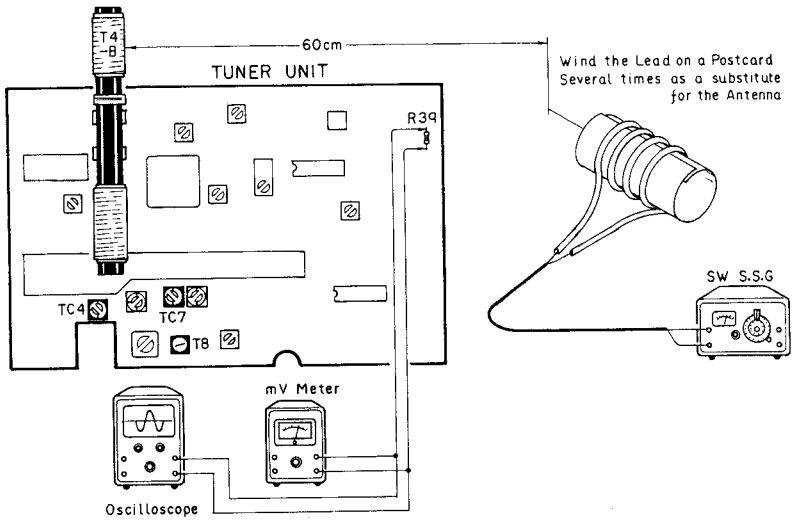


Fig. 3

• To Adjust

Frequency of SW SSG	Variable Condenser Position	Adjusting Point	Remarks
1. 1.9 MHz (400 Hz, 30% modulation) output 60 dB/m.	Maximum (turn the tuning knob counterclockwise.)	T8	1.9 MHz can be received.
2. 6.5 MHz (400 Hz, 30% modulation) output 60 dB/m.	Minimum (turn the tuning knob clockwise.)	TC7	6.5 MHz can be received.
3. Repeat (1) and (2) alternately and adjust so that 1.9 ~ 6.5 MHz are received.			
4. 2.5 MHz (400 Hz, 30% modulation) output 40 ~ 50 dB/m.	Tuned to 2.5 MHz.	T4-B (Coil of bar antenna)	Maximum output.
5. 5.5 MHz (400 Hz, 30% modulation) output 40 ~ 50 dB/m.	Tuned to 5.5 MHz.	TC4	Maximum output.
6. Repeat (4) and (5) alternately and confirm that they are as specified.			

Note: After adjusting T4-B (Coil of bar antenna), melt electro wax with soldering iron and fix it in position.

SW2 TRACKING ADJUSTMENT

• Connection Diagram

Switch positions
Function switch . . . . . RADIO
Band switch. SW2

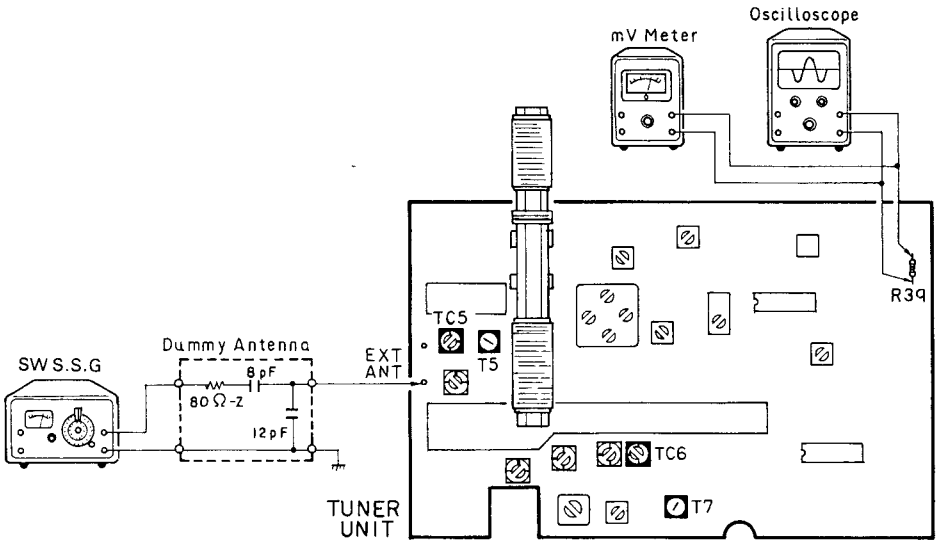


Fig. 4

• To Adjust

Frequency of SW SSG	Variable Condenser Position	Adjusting Point	Remarks
1. 5.5 MHz (400 Hz, 30% modulation) output 60 dB/m.	Maximum (turn the tuning knob counterclockwise.)	T7	5.5 MHz can be received.
2. 18.5 MHz (400 Hz, 30% modulation) output 60 dB/m.	Minimum (turn the tuning knob clockwise.)	TC6	18.5 MHz can be received.
3. Repeat (1) and (2) alternately and adjust so that 5.5 ~ 18.5 MHz are received.			
4. 7 MHz (400 Hz, 30% modulation) output 40 ~ 50 dB/m.	Tuned to 7 MHz.	T5	Maximum output.
5. 18 MHz (400 Hz, 30% modulation) output 40 ~ 50 dB/m.	Tuned to 18 MHz.	TC5	Maximum output.
6. Repeat (4) and (5) alternately and confirm that they are as specified.			

CENTER METER ADJUSTMENT (SK-31F)

• Connection Diagram

Switch positions
Function switch ..... RADIO
Band switch ..... FM
Meter switch ..... TUNE

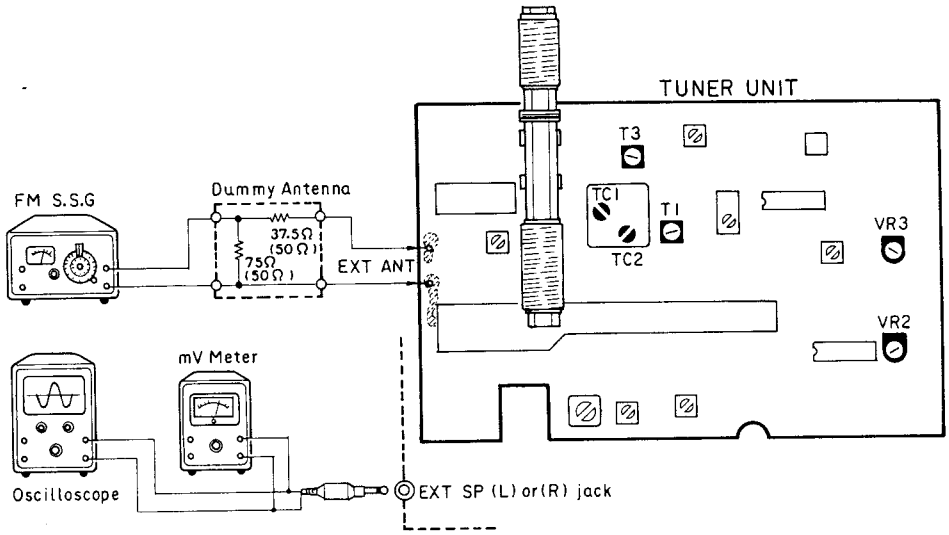


Fig. 5

• To Adjust

1. Rotate the tuning knob and set it to a spot on the dial where no station is broadcasting.
2. Adjust VR3 so that the meter (ME2) pointer deflects to the center.
3. After having adjusted the FM tracking, set the input signal to 60dB (μV) and check that the meter pointer is centered.
4. If the meter is misaligned, repeat the adjustment from step (1).

FM IF ADJUSTMENT

• Connection Diagram

Switch positions
Function switch . . . . . RADIO
Band switch . . . . . FM

Generator Scope
Sweep center frequency . . . . . 10.7 MHz
Input gain . . . . . 0.3 Vp-p/cm
Marker . . . . . OFF or minimum

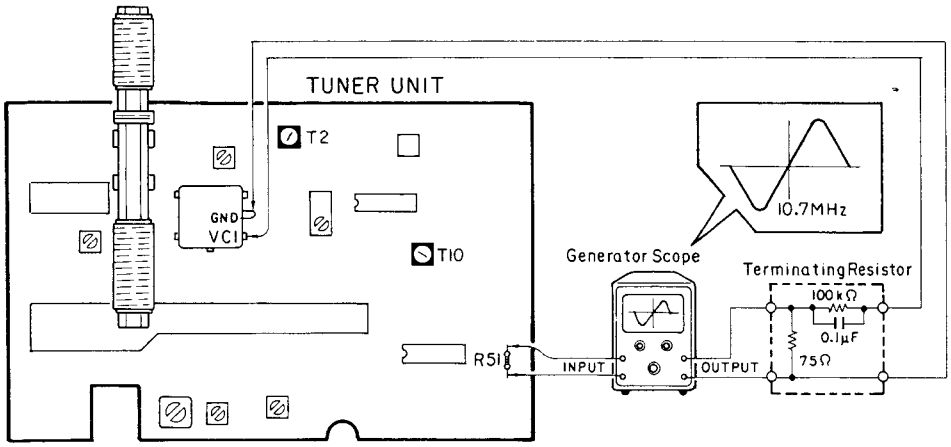


Fig. 6

• To Adjust

1. Apply an output of about 70 dB (μV) from the Generator Scope, adjust T2, T10 and adjust to that the S curve becomes vertically symmetrical and optimum linearity is obtained.

FM TRACKING ADJUSTMENT

• Connection Diagram

See Fig. 5

Switch and control positions.
Function switch . . . . . RADIO
Band switch . . . . . FM
Balance . . . . . Center
Volume control . . . . . Appropriate position

• To Adjust

1. Set the SSG to a 400Hz, 75kHz deviation (100% modulation).
2. Apply an 86.5 MHz, 30dB signal from the SSG and set the tuning knob to its leftmost position.
   Adjust T3 to produce a maximum output.
3. Apply a 109.5MHz 30dB signal from the SSG and rotate the tuning knob to the rightmost position.
   Adjust TC2 to produce a maximum output.
4. Repeat steps (2) and (3) several times and adjust so that the 86.5MHz and 109.5MHz are perfectly received.
5. Set the SSG output to 10 ~ 20dB, and then repeatedly adjust T1 (with 90MHz) and TC1 (with 106MHz) to produce a maximum output at 90MHz and 106MHz.

FM MPX ADJUSTMENT

• Connection Diagram

Switch positions
Function switch ..... RADIO
Band switch ..... FM AUTO

Stereo modulator
Modulation frequency 1kHz
Modulation 100%
Pilot ..... 7.5 kHz
Main ..... 67.5 kHz

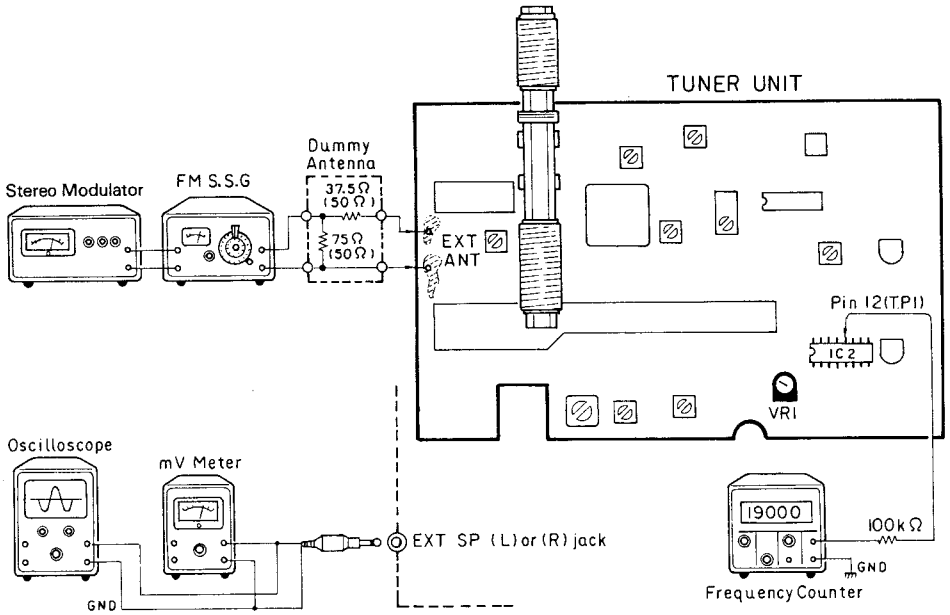
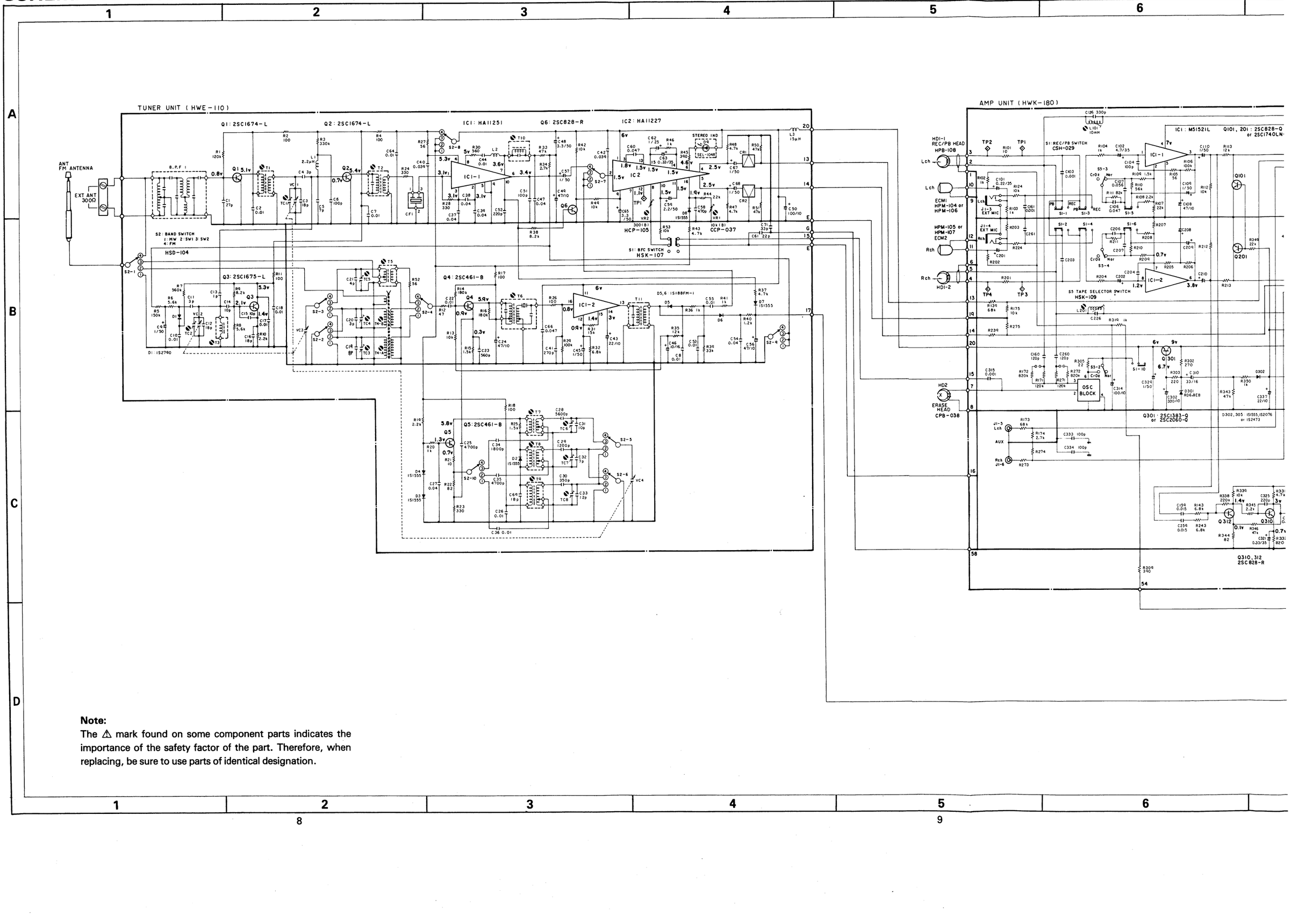


Fig. 7

• To Adjust

1. Apply an 98 MHz 10 dB signal from the FM SSG, and rotate the tunig knob to tune into 98 MHz.
2. Set the FM SSG output to 60 dB and set the modulation to OFF.
3. Adjust VR1 so that the frequency counter indicates 19 kHz ± 20 Hz.

SCHEMATIC CIRCUIT DIAGRAM (SK-21F)



Note:
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

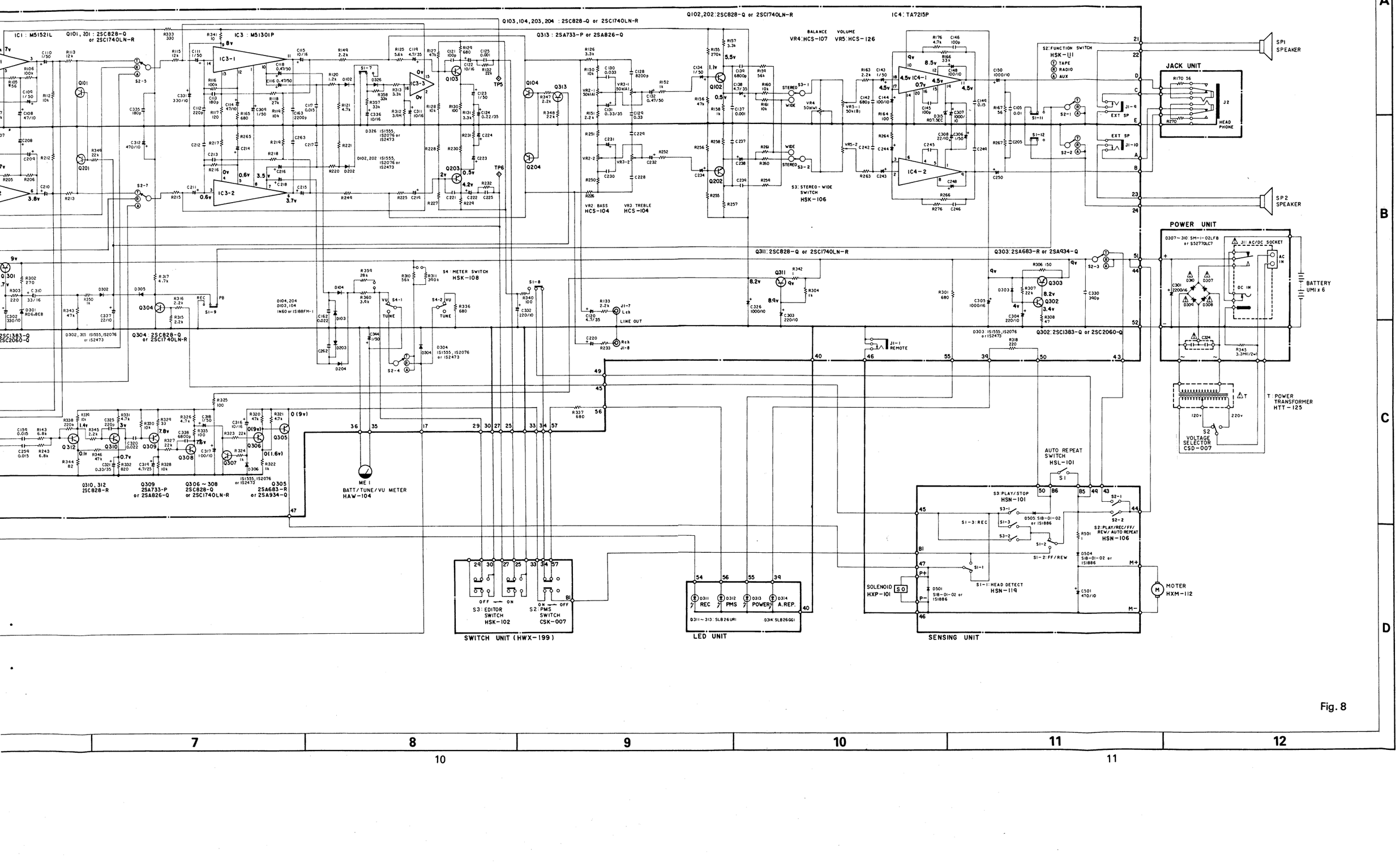
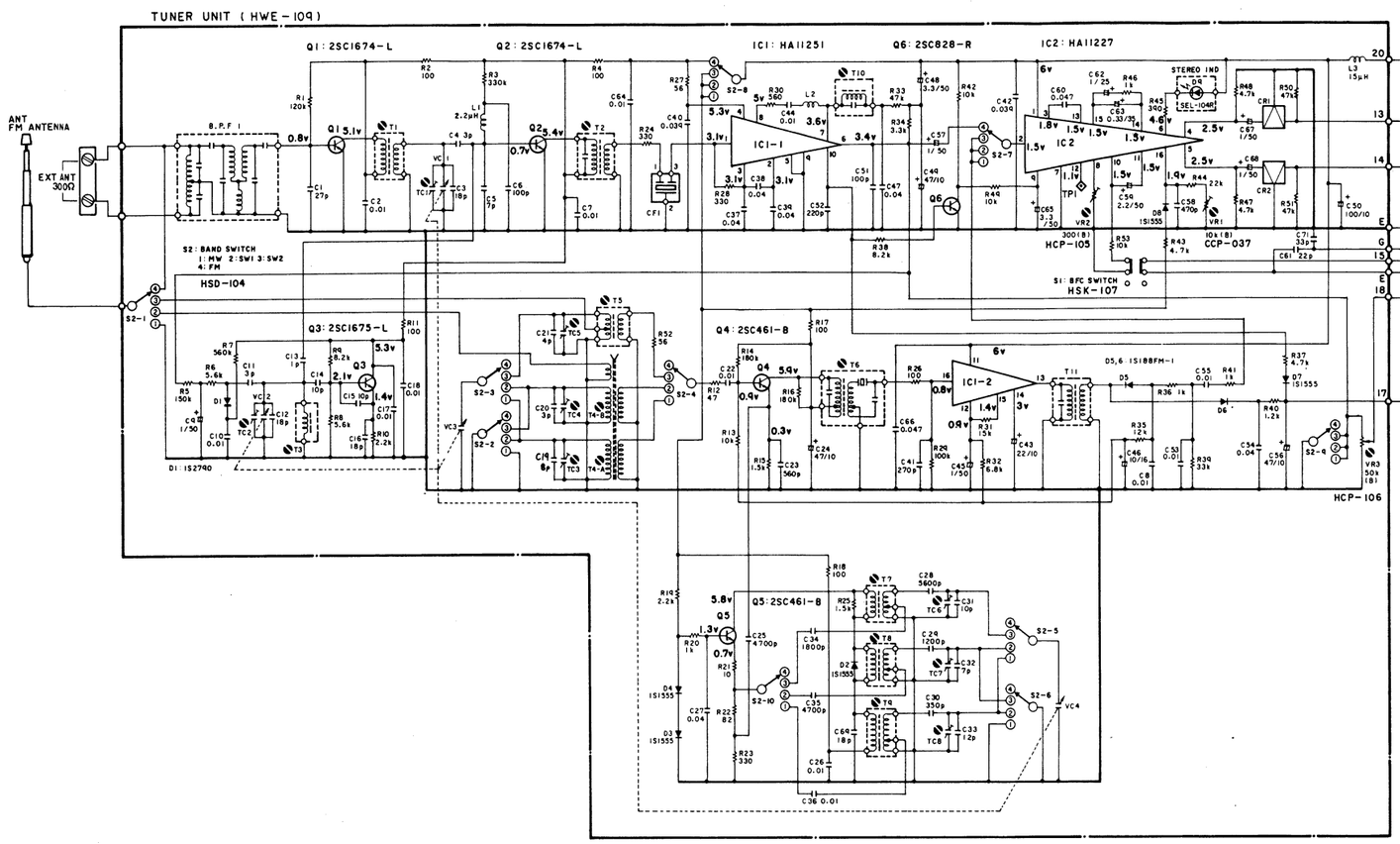
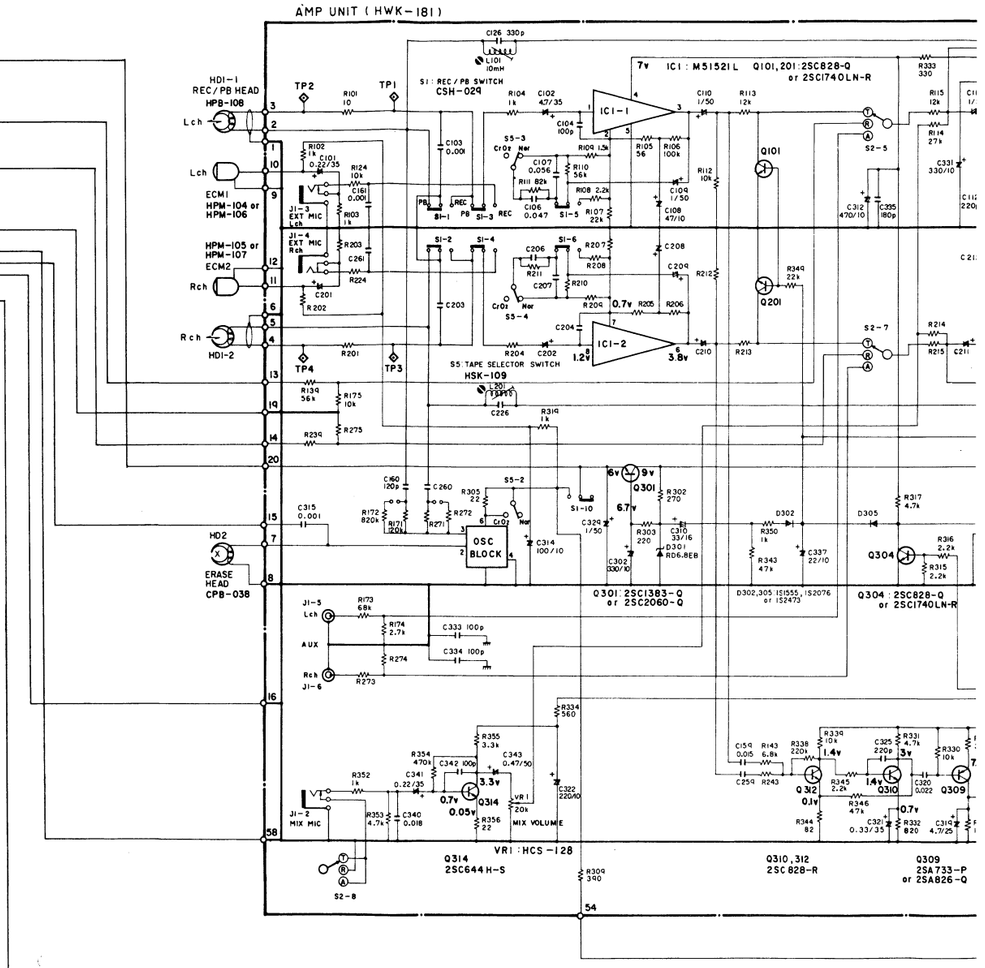

IC1 : M51521L
Q101, 201 : 2SC828-Q or 2SC1740LN-R
IC3 : M51301P
Q103,104,203,204 : 2SC828-Q or 2SC1740LN-R
Q102,202:2SC828-Q or 2SC1740LN-R
IC4: TA7215P
Q313 : 2SA733-P or 2SA826-Q
BALANCE VOLUME
VR4:HCS-107 VR5:HCS-126
S2:FUNCTION SWITCH
HSK-111
T TAPE
R RADIO
A AUX
SPI SPEAKER
SP2 SPEAKER
JACK UNIT
HEAD PHONE
EXT SP
POWER UNIT
AC IN
DC IN
BATTERY UM1 x 6
Q311:2SC828-Q or 2SC1740LN-R
Q303:2SA683-R or 2SA934-Q
Q304 :2SC828-Q or 2SC1740LN-R
Q302:2SC1383-Q or 2SC2060-Q
S4 : METER SWITCH
HSK-108
LINE OUT
REMOTE
T : POWER TRANSFORMER
HTT-125
VOLTAGE SELECTOR
CSD-007
Q310, 312
2SC828-R
Q309
2SA733-P
or 2SA826-Q
Q306 ~ 308
2SC828-Q
or 2SC1740LN-R
Q305
2SA683-R
or 2SA934-Q
METER
BATT/TUNE/VU METER
HAW-104
S3: EDITOR SWITCH
HSK-102
S2: PMS SWITCH
CSK-007
SWITCH UNIT (HWX-199)
LED UNIT
AUTO REPEAT SWITCH
HSL-101
S3:PLAY/STOP
HSN-101
S2:PLAY/REC/FF/REW/AUTO REPEAT
HSN-106
S1-3:REC
S1-2:FF/REW
S1-1:HEAD DETECT
HSN-119
SOLENOID
HXP-101
MOTER
HXM-112
SENSING UNIT

Fig. 8

SCHEMATIC CIRCUIT DIAGRAM (SK-31F)





Note:
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

SK-21F
SK-31F

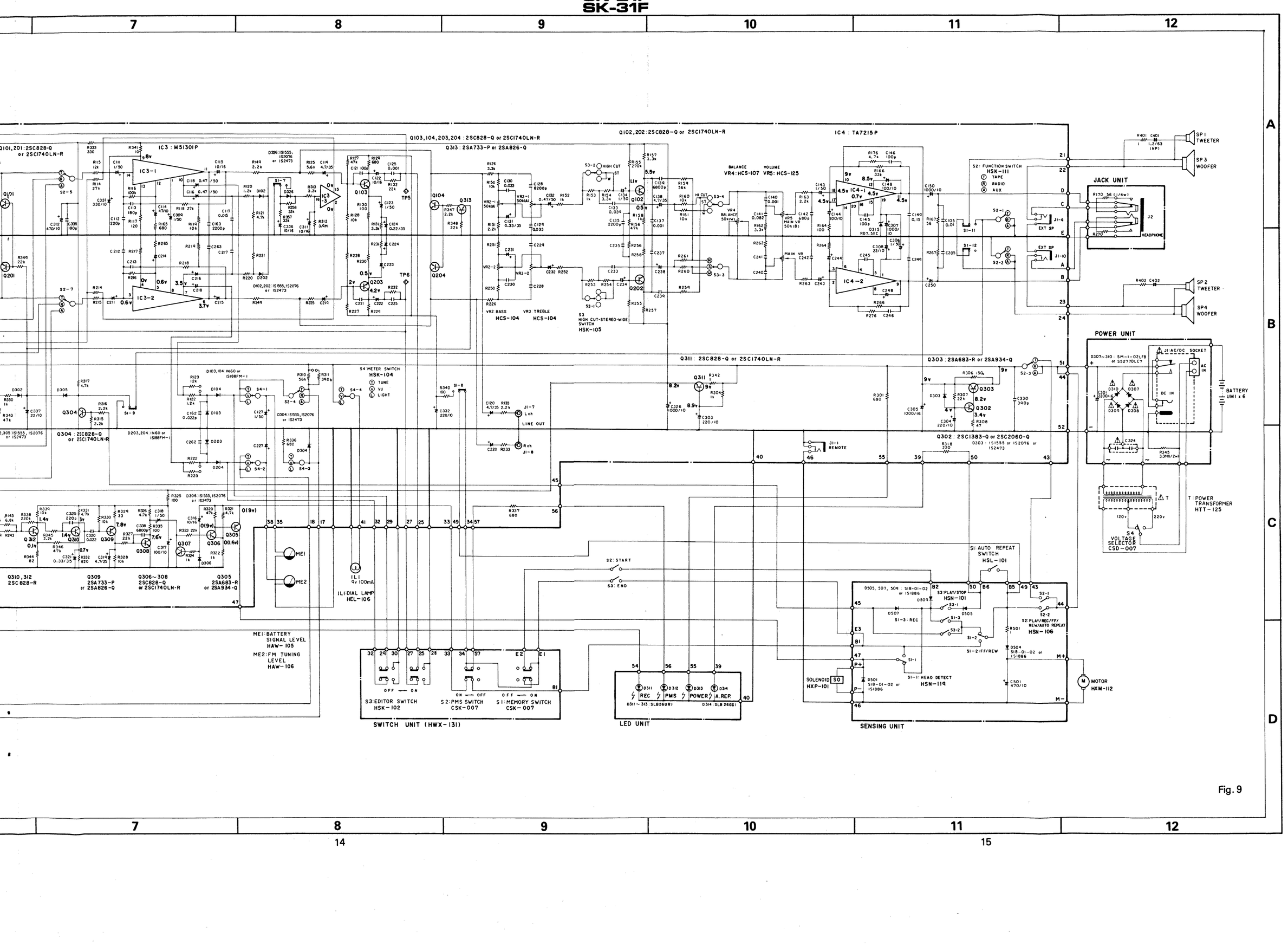


Fig. 9

CONNECTION DIAGRAM (SK-21F)

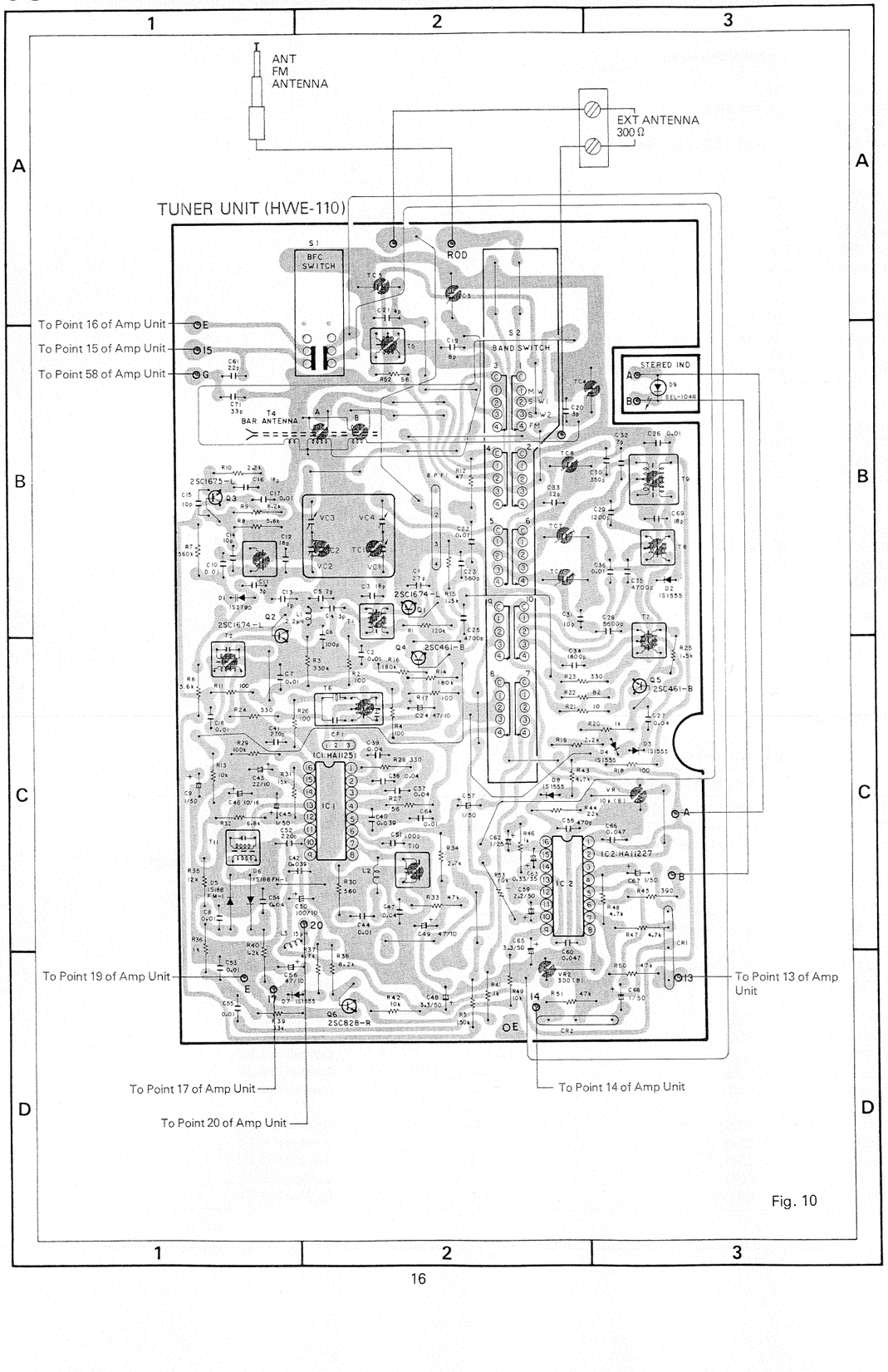


Fig. 10

CONNECTION DIAGRAM (SK-31F)

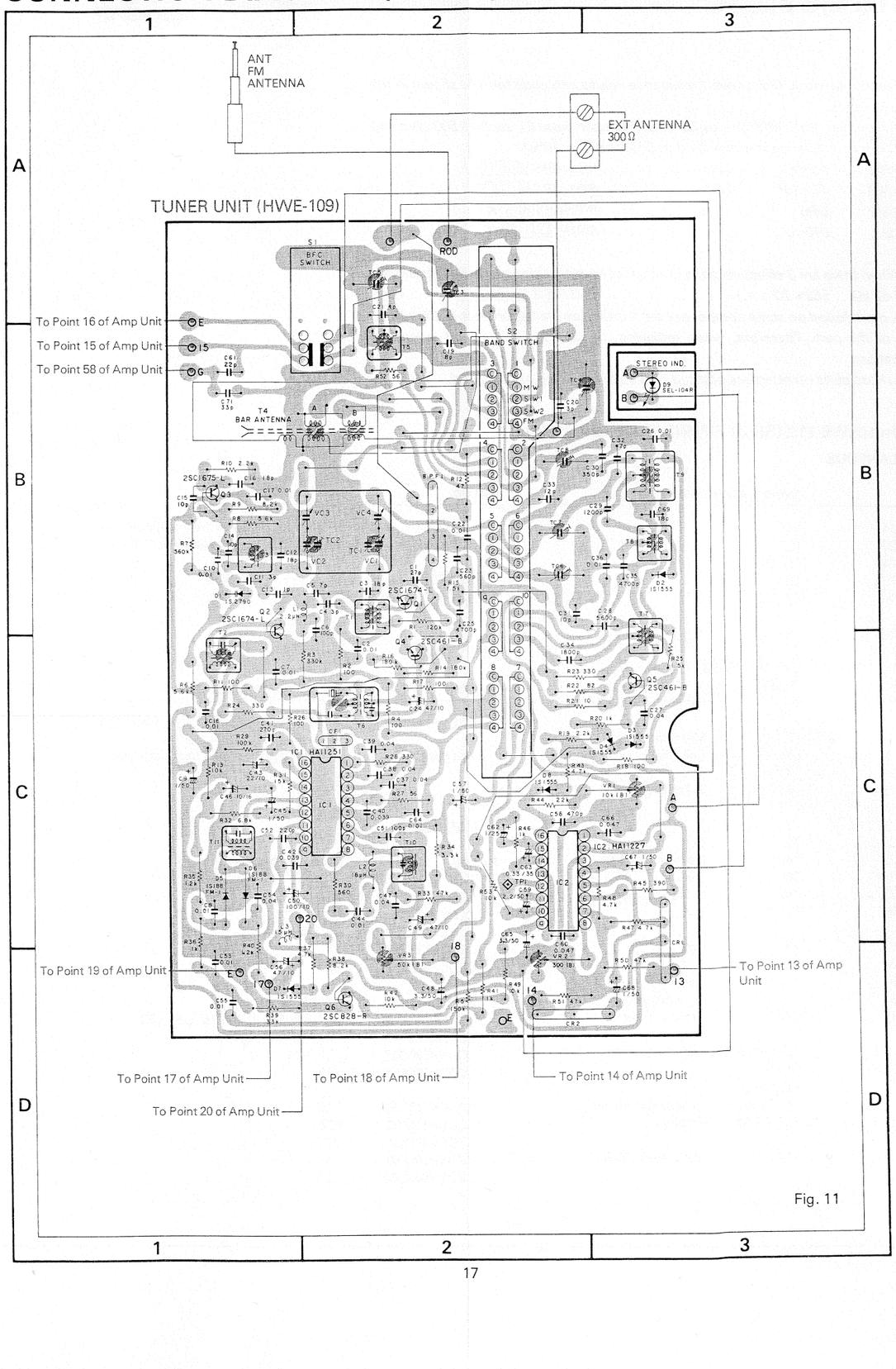


Fig. 11

NOTE:
When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56×10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47×10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562×10¹*	*RN1/4SR 5 6 2 1 F*	

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of indentical designation.*
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Tuner Unit (HWE-110) (SK-21 F/P) (HWE-109) (SK-31F/P)

MISCELLANEOUS

Part No.	Symbol & Description	
HA11251	IC1	
HA11227	IC2	
2SC1674-L	Q1, Q2	
2SC1675-L	Q3	
2SC461-B	Q4, Q5	
2SC828-R	Q6	
1S2790	D1	
1S1555	D2—D4, D7, D8	
1S188FM-1	D5, D6	
CTF-010	L1	Ferri-Inductor, 2.2μH
CTF-071	L2	Micro-Inductor
CTF-016	L3	Coil, 15μH
CTC-061	T1	Coil
CTC-028 or CTC-040	T2	IF Transformer
HTC-135	T3	Coil
HTB-123	T4	Bar Antenna Assy
HTC-139	T5	Coil
HTE-122	T6	IF Transformer
HTC-136	T7	Coil
HTC-137	T8	Coil
HTC-138	T9	Coil
CTC-091	T10	Coil
CTE-090	T11	IF Transformer
CTF-038	CF1	Ceramic Filter
HWW-105	CR1, CR2	MPX Filter
HWW-106	BPF1	
CCL-077	VC1—VC4, TC1, TC2	Variable Condenser
HCK-102	TC3—TC8	Trimmer
CCP-037	VR1	Semi-fixed, 10kΩ (B)

Part No.	Symbol & Description	
HCP-105	VR2	Semi-fixed, 300Ω (B)
HCP-106	VR3	Semi-fixed, 50kΩ (B) (SK-31)
HSD-104	S1	Switch
HSK-107	S2	Switch

RESISTORS

Part No.	Symbol & Description
RD1/4PM□□□J	R1—R4, R6—R10, R12—R24, R26—R33, R35—R40, R42, R44—R51
RD1/4VS□□□J	R5, R11, R25, R34, R41, R43, R52, R53

CAPACITORS

Part No.	Symbol & Description
CCDSL270K50	C1
CKDYF103Z25	C2, C7, C22, C44, C64
CCDSH180K50	C3, C16, C69
CCDSL030D50	C4
CCDSL070F50	C5
CKDYB101K50	C6, C51
CKDYD103M50	C8, C10, C17, C18, C26, C36, C53
CEA010P50	C9, C45, C57, C67, C68
CCDSH030D50	C11, C20
CCDRH180K50	C12
CCDCK010C50	C13
CCDSH100F50	C14
CCDSH100K50	C15
CCDSH080F50	C19
CCDSH040D50	C21

Part No.	Symbol & Description
CKDYB561K50	C23
CEA470P10	C24, C49, C56
CKDBC472M25	C25
CKDYF403Z25	C27, C37—C39, C47, C54
CQSH562K50	C28
CQSH122F50	C29
CQSH351J50	C30
CCDWK100J50	C31
CCDXL070D50	C32
CCDSH120K50	C33
CQMA182K50	C34
CQMA472K50	C35
CKDBC393M25	C40, C42
CEA220P10	C43
CKDYB101K50	C41
CEA100P16	C46
CEA3R3P50	C48, C65
CEA101P10	C50
CKDYB221K50	C52
CKDBC103M25	C55
CCDUJ471K50	C58
CEA2R2P50	C59
CKDBC473M25	C60, C66
CCDSL220K50	C61
CSZA010M25	C62
CSZAR33M35	C63
VACANT	C70
CCDSL330K50	C71

Amp Unit (Page 41)

SK-21/KC, 31/KC		SK-21F/P, 31F/P	
Part No.	Symbol & Description	Part No.	Symbol & Description
HWK-160	Amp Unit (SK-21)	HWK-180	Amp Unit (SK-21)
HWK-169	Amp Unit (SK-31)	HWK-181	Amp Unit (SK-31)
HCS-121	VR1 Volume,20kΩ (B)	———	Deleted (SK-21)
		HCS-128	VR1 Volume, 20kΩ (B) (SK-31)
2SC644H-S	Q314	———	Deleted (SK-21)
RD1/4VM273J	R114, R214	———	Deleted (SK-21)
RD1/4PM273J	R166, R266	RD1/4PM333J	R166
RD1/4PM561J	R334	———	Deleted (SK-21)
RD1/4PM683J	R139, R239	RD1/4PM562J	R139, R239 (SK-31)
RD1/4PM102J	R352	———	Deleted (SK-21)
RD1/4PM472J	R353	———	Deleted (SK-21)
RD1/4PM474J	R354	———	Deleted (SK-21)
RD1/4PM332J	R355	———	Deleted (SK-21)
RD1/4PM220J	R356	———	Deleted (SK-21)
CKPYD102M50	C140	———	Deleted (SK-21)
CEA221P10	C322	———	Deleted (SK-21)
CQMA183M50	C340	———	Deleted (SK-21)
CSZAR22M35	C341	———	Deleted (SK-21)
CCPSL101J50	C342	———	Deleted (SK-21)
CEAR47P50	C343	———	Deleted (SK-21)

Power Unit (Page 43)

SK-21/KC, 31/KC		SK-21F/P, 31F/P	
Part No.	Symbol & Description	Part No.	Symbol & Description
RD1/2PS335J	R345	———	Deleted

Cabinet (Page 44)

SK-21/KC, 31/KC			SK-21F/P, 31F/P	
Key No.	Part No.	Description	Part No.	Description
14.	HNS-254	Rear Case	HNS-325	Rear Case
⚠ 20.	HTT-140	Power Transformer	HTT-125	Power Transformer
⚠ 24.	CKP-025	AC/DC Socket	CKP-020 or CKP-025	AC/DC Socket
49.	HDE-109	Connector	HDE-109	Connector
	HDE-109	Connector	HDE-123	Connector
63.	HXA-511	Door Unit	HXA-604	Door Unit
73.	HXA-506	Front Case Unit (SK-21)	HXA-598	Front Case Unit (SK-21)
	HXA-507	Front Case Unit (SK-31)	HXA-597	Front Case Unit (SK-31)
75.	CNV-977	Cover	———	Deleted
	———	———	CSD-007	Switch (Voltage Selector)
	———	———	HAL-263	Name Plate (SK-21)
			HAL-262	Name Plate (SK-31)

Chassis (Page 45)

SK-21/KC, 31/KC			SK-21F/P, 31F/P	
Key No.	Part No.	Description	Part No.	Description
1.	HWK-160	Amp Unit (SK-21)	HWK-180	Amp Unit (SK-21)
	HWK-169	Amp Unit (SK-31)	HWK-181	Amp Unit (SK-31)
21.	HWE-108	Tuner Unit (SK-21)	HWE-110	Tuner Unit (SK-21)
	HWE-107	Tuner Unit (SK-31)	HWE-109	Tuner Unit (SK-31)
30.	HLA-116	Shaft	HLA-187	Shaft
32.	HNV-151	Pulley (Four)	HNV-151	Pulley (Five)
42.	HAG-159	Scale (SK-21)	HAG-162	Scale (SK-21)
	HAG-158	Scale (SK-31)	HAG-161	Scale (SK-31)

Packing Method

SK-21/KC, 31/KC			SK-21F/P, 31F/P	
Key No.	Part No.	Description	Part No.	Description
⚠ 2.	CDG-029	AC Cord	HDG-114	AC Cord
3.	HRB-144	Owner's Manual (SK-21)	HRD-135	Owner's Manual (SK-21) (English, Spanish)
	HRB-143	Owner's Manual (SK-31)	HRD-141	Owner's Manual (SK-21) (Persian, Arabic)
			HRD-134	Owner's Manual (SK-31) (English, Spanish)
			HRD-140	Owner's Manual (SK-31) (Persian, Arabic)
7.	HHA-394	Carton (SK-21)	HHA-457	Carton (SK-21)
	HHA-392	Carton (SK-31)	HHA-456	Carton (SK-31)